

CLAIMS

1. An antenna system comprising:
 - a stacked patch antenna comprising two or more patch antennas symmetrically aligned around an axis, wherein the stacked patch antenna comprises a differential feed patch antenna.
2. An antenna system as recited in Claim 1, wherein the two or more patch antennas comprise:
 - a first patch antenna; and
 - 10 a second patch antenna, wherein at least a portion of the second patch antenna serves as a ground plane for the first patch antenna.
3. An antenna system as recited in Claim 2, wherein the first patch antenna comprises a high frequency patch antenna, and further wherein the first patch antenna is frequency sensitive.
4. An antenna system as recited in Claim 3, wherein the second patch antenna comprises a patch antenna having a lower frequency than the first patch antenna, and further wherein the second patch antenna is frequency sensitive.
- 20 5. An antenna system as recited in Claim 2, wherein the first patch antenna comprises a single-polarization, differential feed patch antenna comprising:
 - a grounded substrate;
 - a radiating system coupled to the grounded substrate; and

a feed system having two feed points for providing a differential feed signal, wherein the radiating system resonates in response to an excitation by the differential feed signal.

5 6. An antenna system as recited in Claim 5, wherein the second patch antenna comprises a second single-polarization, differential feed patch antenna comprising:
the grounded substrate;
a second radiating system coupled to the grounded substrate; and
the feed system having two feed points for providing the differential feed
10 signal, wherein the second radiating system resonates in response to an excitation by the differential feed signal.

7. An antenna system as recited in Claim 2, wherein the first patch antenna comprises a dual-polarization, differential feed patch antenna comprising:
15 a grounded substrate;
a first radiating system coupled to the grounded substrate; and
a first feed system comprising two or more pairs of first feedpoints, wherein the two or more pairs of first feedpoints provide two or more first differential feed signals, wherein the first radiating system resonates in response to an excitation by the
20 two or more differential feed signals.

8. An antenna system as recited in Claim 7 wherein the two or more pairs of first feedpoints are orthogonally located with respect to each other.

9. An antenna system as recited in Claim 7, wherein the two or more first differential feed signals are further combined in phase quadrature to yield a first pair of circular polarized signals.

5 10. An antenna system as recited in Claim 7, wherein the second patch antenna comprises a second dual-polarization, differential feed patch antenna comprising:
the grounded substrate;
a second radiating system coupled to the grounded substrate; and
a second feed system comprising two or more pairs of second feedpoints,
10 wherein the two or more pairs of second feedpoints provide two or more second differential feed signals, wherein the second radiating system resonates in response to an excitation by the two or more second differential feed signals.

11. An antenna system as recited in Claim 10 wherein the two or more pairs of
15 second feedpoints are orthogonally located with respect to each other.

12. An antenna system as recited in Claim 10, wherein the two or more second differential feed signals are further combined in phase quadrature to yield a second pair of circular polarized signals.

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13. An antenna system as recited in Claim 9 wherein the second patch antenna comprises a second dual-polarization, differential feed patch antenna comprising:
the grounded substrate;
a second radiating system coupled to the grounded substrate; and

a second feed system comprising two or more pairs of second feedpoints, wherein the two or more pairs of second feedpoints provide two or more second differential feed signals, wherein the second radiating system resonates in response to an excitation by the two or more second differential feed signals, and further wherein

5 the two or more second differential feed signals are further combined in phase quadrature to yield a second pair of circular polarized signals.

14. An antenna system as recited in Claim 2, wherein the second patch antenna is differentially fed via two or more second feedpoints located around a center point,

10 wherein the center point comprises a zero potential point.

15. An antenna system as recited in Claim 14, wherein each of the two or more second feedpoints are comprised of a coaxial feed rod.

15 16. An antenna system as recited in Claim 14, wherein the first patch antenna is further differentially fed via two or more first feedpoints located around the center point.

17. An antenna system as recited in Claim 16, wherein each of the two or more first feedpoints and each of the two or more second feedpoints are comprises of a coaxial feed rod.